

Appendix I

WORKSHOP AGENDA



ICRI Middle East Seas Workshop Agenda

DAY 1

September 21, 1997

Sunday

0900 - Workshop Opening

- 1030
1. Welcome remarks and introductions by Dr. Fayez E. Khasawneh - President of the Aqaba Region Authority
 2. Welcome remarks by Dr. Peter Thomas, U.S. State Department and Former ICRI Secretariat
 3. Opening remarks by Mr. Richard Kenchington ICRI Secretariat and Workshop Facilitator
 4. Presentation on: The State of the Worlds Reefs by Dr. Michael Crosby, U.S. National Oceanic and Atmospheric Administration National Research Coordinator
 5. ICRI and the International Year of the Reef by Mr. John Baldwin, ICRI Secretariat

1030 - 1100 BREAK

1100 - Workshop Orientation

- 1230
1. Presentation on the ICRI *Call and Framework for Action* content and results of other regional workshops. Ben Mieremet, former ICRI Secretariat
 2. Objectives, Agenda, Rules of the Workshop. Co-Chairs Ahmed Shehata and Richard Kenchington

1200 - 1330 LUNCH

1330 - COUNTRY and NGO REPORTS 1500

- Egypt
- Yemen
- Oman
- Jordan

1500 - 1530 BREAK

1530 - COUNTRY and NGO REPORTS continued 1700

- Israel
- Djibouti
- The World Bank
- Ecopeace
- Winrock International Environmental Alliance

1800 DINNER Reception

1930 - Movie - The Fragile Ring of Life



DAY 2
September 22, 1997
Monday

0830 - 1000 ICRI Open Forum and Working Group Assignments

1000 - 1030 BREAK

1030 - 1200 Working Group Organization and Orientation

Working Group #1, #2 and #3 will all work on the same ICRI issues to include management practices, capacity building, and research and monitoring

1200 - 1330 LUNCH

1330 - 1500 Working Groups 1, 2, and 3: Define and Prioritize Issues

1500 - 1530 BREAK

1530 - 1700 Working Groups 1,2 and 3: Identify Actions

The three WGs will identify specific, feasible actions and next steps to implement solutions to the priority problems defined earlier.

1700 - 1730 Working Groups Report to Plenary.

1800 DINNER

DAY 3
September 23, 1997
Tuesday

0830 - 1000 WGs 1, 2 and 3 Report To the Workshop: Discussion *Co-Chairs*

1000 - 1030 BREAK

1030 - 1200 Working Groups continue deliberations

1200-1330 LUNCH

1330 - 1500 Plenary discussion of Proposed Findings

1500 - 1530 BREAK



1530 - Global Coral Reef Monitoring Network and Node Possibilities for the Region
1615

Mr. John Baldwin

1615 - Marine Protected Areas: Short presentations on the marine parks of the region by Jordan,
1700 Israel, Egypt to be visited during the field trip and their role in coral reef protection,
research, tourism.

DAY 4

September 24, 1997

Wednesday

0700 - WORKSHOP FIELD TRIP (1/2 day)
0900

Boat tour doing a circle from Aqaba, Taba, Eilat to see developments of parks in progress and one already intensively used and managed. Participants will see urban and port areas, hotel and recreation areas, industrial areas, new park developments and management tools used for intensively used park areas, mariculture projects and discuss the need for regional cooperative research and monitoring.

9000 - Shoreline tour of Aqaba with visit to Marine Science Center and Royal Dive Club
1200 Snorkeling and scuba available for those inclined.

1200 - LUNCH
1300

1300- Drafting Teams work on Report.
1400

1400 - Site visit to the Wadi Rum sponsored by the ARA

DAY 5

September 25, 1997

Thursday

0830 - Presentation and Review of 2nd Draft of Document *Chairmen Shehata and Baldwin*
1100

1100 - ADOPTION OF THE DOCUMENT AND WORKSHOP CLOSING REMARKS
Distribution of Certificates of Appreciation and Special Hanging depicting Aqaba Shoreline Environment



Appendix II

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Appendix III

WORK GROUPS I, II, III REPORTS



Note: The results of the individual working groups does not necessarily denote consensus on all issues and actions. They do represent an intense period of idea generation which can lead to further discussion, individual actions or regional accomplishments.



Results of Individual Working Groups

Working Group 1

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Issue 1: Lack of Planning

- population growth and related infrastructure such as urban, industrial, tourism and agricultural developments.

Objective: Establish consensus and partnerships with planning agencies

Coastal Zone Management

Adopt necessary legislation for land use planning
Relate development with population growth
Environment Impact Assessment for any new development project
Adopt coastal land use plan (zoning)
Involve all relevant agencies, authorities and NGOs in coastal zone planning

Capacity Building

Develop national/regional workshops on importance of coastal zone management
(apply ISO 14000)
Develop GIS for planning and training
Improve NGO capacity for planning

Monitoring and Research

Environmental Impact Assessment for each development (before, during, after)
Agree on common indicators (socioeconomic, ecological, etc.)

Evaluation Criteria

Adoption/improvement of legislation
GIS development
EIA documents tally with developments
Number of workshops held



Issue 2: Weakness in Management of Fisheries

- commercial, sport, subsistence purposes.

Objective: Prepare and adopt plan to achieve sustainable fisheries

Coastal Zone Management

Adopt regulations/rules for fisheries

- national and regional (fisheries management council)

- timing, areas, quality, quantity

- regulation of destructive methods

Create protected areas or fisheries reserves

Environmental Impact Assessment for fishing activities in particular mariculture

Promote sustainable mariculture

Capacity Building

Public awareness

Training fishermen

- new technologies (offshore/deep sea)

- traditional techniques

- vocational retraining

Create specialised laboratory on fish disease and parasites

Create a fisheries management body (regional/national)

Monitoring and Research

Fish biodiversity

Endemism and endangered species

Stock and catch assessment

Fish disease

Oceanologic parameters

Develop fishery database (regional/national)

Evaluation Criteria

Number of fishermen trained

Improvement of fish stock

Adoption of regulations

New fisheries management body

Issue 3: Coastal ecosystem degradation from multiple sources

- oil, nutrients, sedimentation, thermal effluent, land based sources, infrastructures, agriculture.

Objective: Improve coordination between regulatory authorities and develop contingency planning

Coastal Zone Management

Coordination between authorities dealing with waste, hazardous substances, oil, shipping, and tourism.

Create protected areas

Adopt setback regulations

Promote mitigation measures and habitat restoration programmes

Adopt national and regional contingency plans

Capacity Building

Training for implementation of national and regional contingency plans

Training of decision makers/managers /users

Monitoring and Research

Develop and adopt standardised systems and indicators to monitor coastal degradation

Implement national monitoring connected to a regional database

Evaluation Criteria

Level of pollution decreased

Number of accidents (oil spills and groundings) decreased

Number of personnel trained

Legislation adopted or improved

Level of reef degradation decreased

Issue 4: Direct physical damage to coral reefs

- tourism and park visitors, non protected/managed areas
- impact assessment of natural phenomena: earthquake, erosion, climate change, low tides, natural stresses and biological phenomena

Objective: Reduce user damage by education and enforcement

Coastal Zone Management

Adopt and enforce specific regulations (development, access, discharge, etc.)

Closure of areas or creation of protected areas

Adopt regional code systems for buoys

Capacity Building

Training for patrolling, awareness, enforcement

Training of dive guides and beach guards/users

Develop regional cooperation between coastal authorities



and managers

Monitoring and Research

Develop and adopt standardised systems and indicators to monitor

- water quality
- reef quality
- setback standards

Develop standard database

Network national database regionally

Evaluation Criteria

Quality survey on annual basis

Increase/decrease of rate of damage

Number of personnel trained

Databases developed/operational

Systems linked regionally

Issue 5: Threats to regional/national biodiversity

- non sustainable trade of coral reef and associated resources - aquarium, jewellery, gifts.
- migratory species

Objective: Improve biodiversity conservation through implementation of international conventions and national legislation

Coastal Zone Management

Adopt necessary legislation (and ratify international conventions)

Improve cooperation between relevant ministries (environment, fisheries, agriculture, tourism, etc.)

Develop network of protected areas

Capacity Building

Supply media with relevant information for public education

Training of staff (including customs officers) to implement national legislation and international conventions

Monitoring and Research

Develop and adopt standardised systems and indicators and produce national annual report

Regular inspection of trade of marine species

Survey of public knowledge

Evaluation Criteria

Number of violations decreased

List of countries which have signed international conventions

List of protected areas (existing and planned)

CITES rating

Issue 6: Lack of public awareness

- regional/national
- lack of communication
- media campaign

Objective: Develop public awareness targeting authorities, managers, users, etc.

Public Awareness Strategy

Improve national awareness on:

- laws, regulations and international conventions
- marine and coastal ecosystems sensitivity

Improve regional awareness

Produce educational and awareness materials

Develop regional/international connections through Internet

Capacity Building

Training target groups for education and awareness purposes (NGOs, school teachers, dive guides, hotel managers, boat skippers, etc.)

Monitoring

Questionnaires and surveys on environmental awareness and resource utilisation

Evaluation Criteria

Production of educational/awareness materials

Number of target groups trained



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Report from Working Group 2

I. MONITORING AND RESEARCH

A. Research versus Monitoring

An artificial distinction should not be made between research and monitoring, since results from basic research feed into new methods of monitoring. Dr. Y.A. illustrated this point with an example of his basic research on the effects of nutrient levels on zooxanthellae in coral. The research showed that the greater the nutrient load, the greater the number of zooxanthellae, and therefore the darker the coral. This darkness is a new method of monitoring, since the darkness of the coral can be used as an indicator of increased nutrients *before* the problem reaches the point where macroalgal blooms occur.

B. What to Monitor¹

It is important to develop tools to measure the well being of corals before their deterioration has pro-

ceeded to a serious level, allowing steps to be taken early enough to prevent serious damage. To do this we must do long-term monitoring at the earliest possible stage at which the corals respond to their environment, at the cellular level. The next stage of response is at the level of the organism, for example invertebrate physiology. However, responses are most commonly monitored at the latest stage in the process of deterioration, when effects impact the community as a whole. This is normally monitored using transects to measure populations.

C. Why Monitor?

The purpose of monitoring is to: 1) determine the causes of reef degradation, 2) determine the results of our attempts to prevent degradation, and 3) to inform decision makers.

¹ The group began listing the usual causes of coral reef degradation that should be monitored (such as freshwater runoff, anchoring, industrial effluent, oil pollution, tourism development, reef use, fishing, etc.), but decided that such a list had been compiled before.



D. Regional Approaches to Research and Monitoring

The unique features of the Middle East region are its desert surroundings and semi-closed marine ecosystems. To address these issues on a regional level, the following steps should be taken:

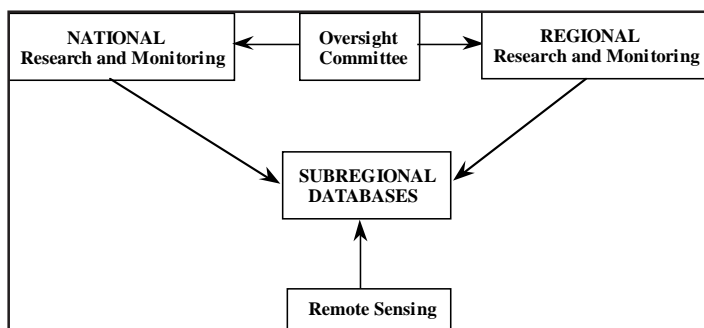
1. In addition to coastal work, develop a regional framework to monitor the *open waters* of the semi-closed systems in the region, e.g. currents and pelagic fisheries.

2. Set standards of how and what to monitor. How to perform monitoring, that is, the methods of data collection, should not be an issue since scientific methods are generally already standardized. What to monitor is a more difficult question, which was not resolved during this session. One extreme is to use the lowest common denominator of research and monitoring (e.g., measuring populations with transects). The disadvantage of this approach is that the quality of the science informing decision-making suffers, while the advantage is that everyone in the region can do it. Questions of uniformity are not an issue for remote sensing data, such as satellite data, to which all countries in the region have access.

3. Monitor the water-soluble fraction of petroleum products.

4. Monitor, on a national level, the nutrient inputs from land and share the data among countries in the region.

5. One example of a regional database model follows: Create regional databases broken down into four sub-regions: Gulf of Aqaba, Red Sea, Gulf of Aden, and Arabian Gulf. The framework for the regional database would be as follows:



The purpose of an oversight committee is to: 1) coordinate the different sub-regions, and 2) create coherence within each of the sub-regions. Other models were also discussed with no consensus established, and a model acceptable to region entities would need to be determined.

Databasing should also include posting to the Internet, so

² *Language impacts all aspects of capacity building: professional dialogue, public outreach, global information access, and training (on the level of communities, nations, regions). English should be used for communication on a regional and global level, while on a national and local level the information can be distributed in the local language as appropriate.*

all countries, including the public, NGOs, and other interest groups can make use of the information.

II. CAPACITY BUILDING²

A. Training Marine Protected Area (MPA) Managers

1. Ways to train regional MPA managers

Academic training still has an important place in preparing MPA managers. Such trained professionals have a combined range of expertise which can they can bring together to exchange expertise, carry out professional collaborations, and acquire complementary training pertinent to managing MPAs in the region. Another important mechanism is to hold regular regional meetings of MPA managers and staff for the purpose of transforming their expertise into viable actions. Some of these meetings should also include the spectrum of stakeholders involved, such as fishermen and hotel and dive operators.

2. Location of training

Each country in the region has existing training centers, but there are advantages to having one single *regional* training center specifically for MPA. Another option is to have the responsibility for hosting regional training rotate among the countries.

3. Issues that MPA managers need to be concerned with are:

- public awareness
- patrolling and enforcement
- scientific monitoring of the reef
- monitoring and mitigating impacts of reef use

B. Training for the Public and Local Interests

1. The groups that must be trained are:

- Fisherman
- Dive and hotel operators
- Solid waste and sewage managers
- Port managers
- Industry
- The community

2. Training Mechanisms

The nature of the training will depend on the situation. For example, if regulations are enacted to move fishing off of the reefs into deeper water, re-training of fishermen will be required. For hotel operators, there might be a voluntary program. One mechanism of increasing public awareness is to have regional “clean up days” to involve the public and educate them.



III. Integrated Coastal Zone Management

<u>ISSUE</u>	<u>Objective</u>	<u>ACTION</u>	<u>Implementation</u>	<u>Perf. Criteria</u>
REEF DAMAGE	Reef restoration	a. Artificial Reefs b. "Coral Gardening" coral restoration, coral nurseries	Exchange of information: apprenticeships, manuals, training seminars	% restoration
	Reef preservation	a. Navigational aids	Lighthouses, electronic navigational aids, buoys, mandatory pilots	% groundings and collisions;
		b. Oil spill response	Nat'l oil spill response centers, regional coord'n for large spill response	# successful responses, pellet monitoring
		c. Oil spill prevention	Tanker size limits, tanker design requirements, marine field leak detection	Regional port records, # spills
		d. Phosphate mining pollution prevention	Dust control, ongoing monitoring	Dust reduction and monitoring
		e. Nutrient enrichment prevention (sewage mngt)	Diversion to land use, discharge away from reefs, sewage treatment, monitoring effluent, zero discharge policies	Measurements on plant effluent and seawater (bacteria, dissolved O2, plant maint)
		f. Solid waste mngt (from land)	Banning plastic bags, recycling, collection & land disposal, educ'n, cleanup days	reduction in sea waste
		g. Solid waste mngt (from ships)	Port reception, patrolling & enforcement, educ'n awareness	monitoring sea & beach waste amt of fines
		h. Thermal pollution prevention	Diffusers, damage detection, monitoring	# diffusers, water temp
		i. Sedimentation prevention	Flood control, beach front protection, land use mngt, bans on sand imports	Turbidity, sediment coverage
		i. Ballast water management	Monitor the problem (sampling, entry into regional database)	Evaluation of record-keeping
		j. Heavy metal pollution prevention (incl. phosphate)	Coral skeleton sampling, monitoring industrial effluent	Sea water heavy metal concentrat'n
	Prevent coral removal	a. Ban removal, dynamite, commercial ventures		



<u>ISSUE</u>	<u>Objective</u>	<u>ACTION</u>	<u>Implementation</u>	<u>Perf. Criteria</u>
Fisheries Resources Depletion	Reduce Over-harvesting; shift harvesting off of reef areas	General —> a. Regulate lobster harvesting b. Ban fishing on reefs c. Regulate abalone harvesting d. Regulate shrimp harvesting e. Ban removal of reef fish f. Regulate shark fishing g. Ban removal, sale of aquarium fish h. Ban turtle harvesting i. Ban on poisons & explosives	ALL ACTIONS: Legislation, education, create marine protected areas (MPAs), public awareness, patrolling & enforcement, export controls. Ban net trapping, regulate harvesting equipment Establish limited harvesting season Establish limited seasons, encourage land-based farming, develop substitute Catch limits, require use and removal of whole fish Encourage nurseries Establish protected nesting areas	Disappearance from market Disappearance from market census data

Mariculture THE ACTIONS, IMPLEMENTATIONS and PERFORMANCE CRITERIA LISTED BELOW APPLY TO ALL 3 MARICULTURE OBJECTIVES

1. Reduce nutrient loading	a. Encourage land-based mariculture or closed systems	i. Incentives to shift to mariculture (taxes, tax breaks, subsidies, grants)	Production levels, market shift indices, support from government & international agencies, nutrient loading, income measurements
2. Reduce pressure on marine fisheries	b. Regulate marine mariculture	ii. Guidelines for location & functioning	
3. Supply protein sources with minimal environ'l impacts	c. Regulate overfishing d. Develop mariculture in appropriate locations with appropriate technology	iii. Fish quotas	



Working Group 3

Participants

Chairperson: Yossi Loya, IUI, Israel
Facilitator: John Baldwin, ICRI Secretariat, Australia
Rapporteur: Steve Morrison, NOAA, USA

<i>Participants</i>	<i>Institution</i>
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Mohammed Al-Hamouri	Red Sea Marine Peace Park, Jordan
Musallam Al-Jabri	MRME, Oman
Nabil Mohammed	ISERST
Gamil Saeed	E.P.C., Yemen
Mansour Qoqazah	Ports Corporation, Aqaba
Peter Thomas	U.S. Dept. of State
Michael Crosby	U.S. NOAA

Report of Working Group 3

Issue

Overall Capacity Building

Objective

Develop capacity building nationally and regionally, by improving structure, proper training of staff and provide countries with needed facilities. Improve awareness at all levels, particularly governments, of the importance of coral reefs to the well-being of each country.

Actions

- Identify capabilities and training needs within each country at all levels.
- Identify where training exists within the region and other parts of the world. make this information available to countries within the region.
- Identify and develop capacity for regional training centers.
- Seek regional and international opportunities to heighten government level awareness of economic value of coral reefs and importance of their sustainable use.
- Identify and share information on a regional and national level of current and potential donors.

Issue

Overall Research & Monitoring

Objective

Development of coordinated research targeted on managing problems to support each nation's management objectives.

Actions

- Establish Global Coral Reef Monitoring Network node(s) in the region
- Promote biological physical, chemical, research to improve understanding of essential reef processes
- Monitor living coverage area of reefs and its major faunistic and floristic components/ mapping and assessment of the health of reefs/
- Monitor change over time
- Build network of communication to coordinate regional R&M
- Increase government awareness to increase support for R&M



Management Issues

Issue

Regional Coordination of ICRI

Objective

To provide better communication and coordination of regional activities.

Actions

- Establish ICRI regional secretariat
- Establish 2 focal points for communications 1)Aqaba-Red Sea; 2)Oman-Arabian Sea

Issue

Tourism development and activities

Objective

Enhance environmentally sustainable coral reef tourism development & activities

Action

Improve environmental awareness in tourist industry through communication and marketing

Issue

Oil Pollution and production

Objective

Work with oil industry to minimize its impact on the environment

Actions

- Establish national & regional oil contingency plans & oil spill prevention & emergency response headquarters
- Establish & extend communications between nations

Issue

Solid and sewage pollution

Objective

Eliminate solid waste discharge. Restrict sewage discharge to environmentally acceptable standards.

Actions

- Determine carrying capacity of ecosystem
- Set standards for discharge

Issue

Fisheries

Objective

Promote sustainable commercial, recreational and artesinal fisheries

Actions

- Ban destructive fishing methods
- Develop & implement comprehensive fisheries management plan encompassing: zoning, education & outreach

Issue

Other industry/construction

Objective

All construction to have zero discharge

Actions

- All new construction require external EIA
- Permit only issued when external EIA (w/ no discharge) is approved

Issue

Urban development/ population growth

Objective

Promote sustainable urban growth that minimizes impact to coral reef ecosystems

Actions

- Develop & implement long-term comprehensive management plans with input from all stakeholders
- Building away from coastline

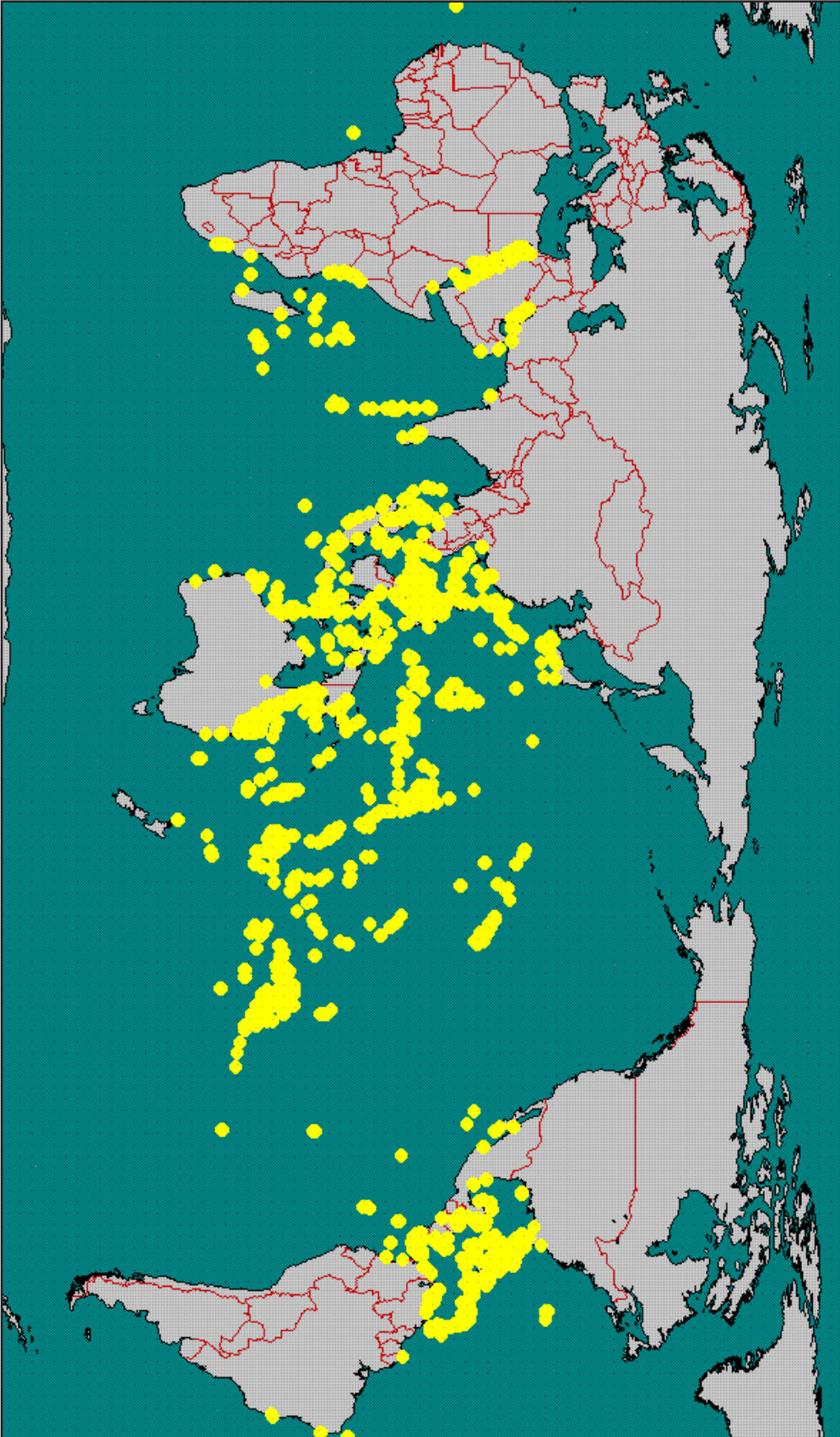


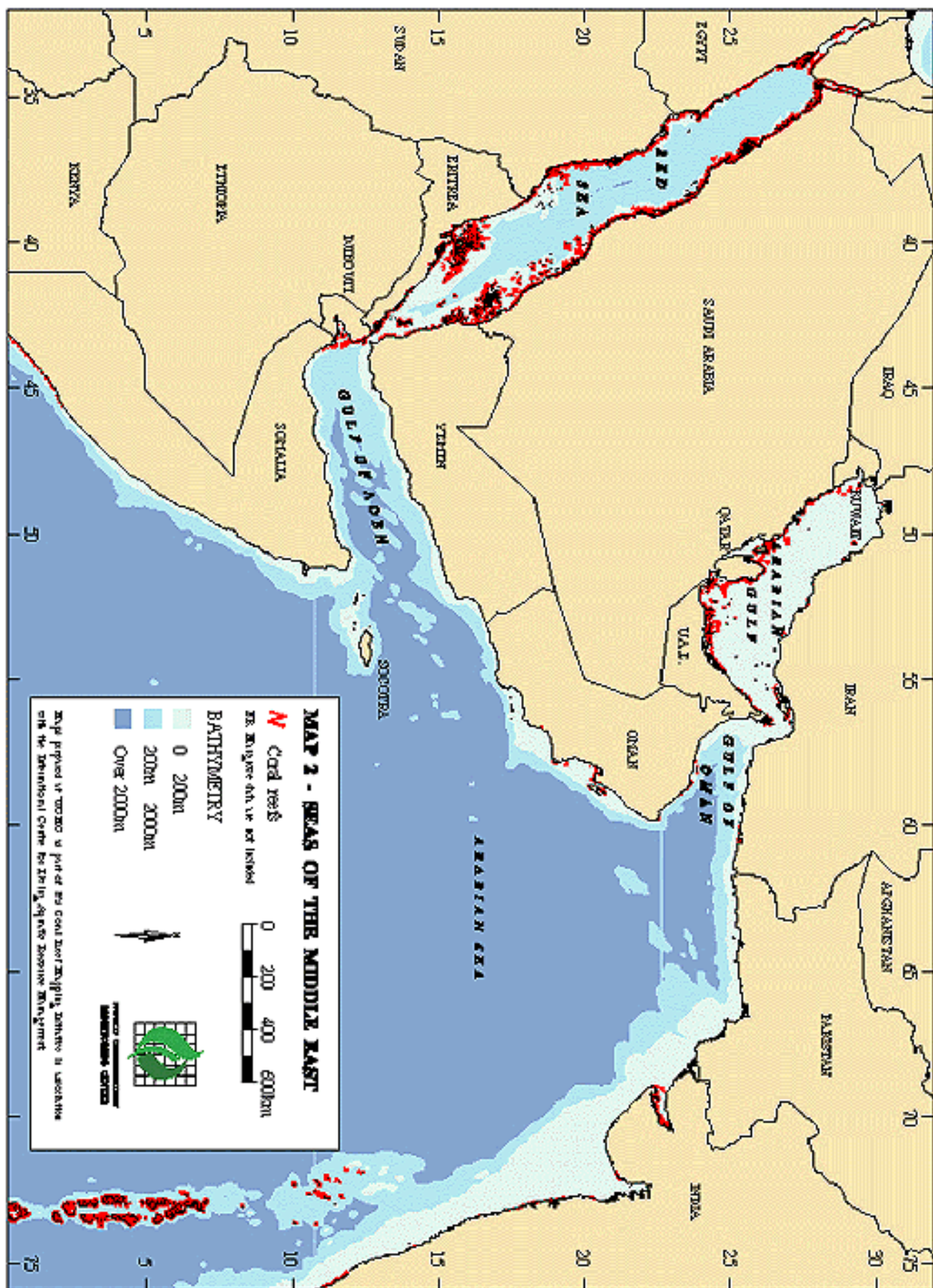
Appendix IV

SLIDE SHOW PRESENTATION OF DR. MICHAEL CROSBY



Global Distribution of Coral Reefs





Global Reef Building Coral Genera



Map of the diversity and global distribution of reef building coral genera, illustrating the highest number of genera to be in eastern Southeast Asia

Values of Coral Reef Biodiversity

- Naturally create, support, and repair islands
- Protect coastlines from shoreline erosion
- Subsistence and commercial fisheries harvest
- Accretion and erosion maintains beaches
- Provides habitat for seagrasses and mangroves
- Recreational resources for locals and tourists
- Channels provide safe navigation and harbors
- Medical and biotechnology

Causes of Coral Reef Degradation

Examples of Natural Stresses

- Crow-of-Thorns (starfish, *Acanthaster* spp.)
- Tropical Storm Damage
- Earthquakes
- Wave Action
- Flooding and Freshwater Runoff
- Disease
- Warmer Ocean Temperature Fluctuations Resulting in Coral Bleaching

Examples of Anthropogenic Stresses

- Human population increases, migration and intensified uses
- Overfishing and destructive methods (e.g., dynamite, poisons)
- Untreated domestic sewage and industrial effluent
- Non-point source pollution, (e.g., agricultural runoff, contamination of aquifers)
- Ship-based pollution (e.g., oil, plastics, bilge water)
- Mangrove overharvest or displacement for aquaculture ponds
- Sedimentation from deforestation or poor land use
- Coral and sand mining
- Dredging and filling
- Collection of corals and ornamental reef species



Recommendations for Global and Regional Action

- Integrated coastal zone management
- Capacity building
- Improved scientific understanding of coral reef ecosystems, with effective translation and transfer of this information to managers/policymakers

Integrated Coastal Zone Management

- Place immediate priority on the development and implementation of ICZM strategies, which should address:
 - Public education
 - Community development
 - Economic incentives and alternative income generation
 - Global or regional legal instruments
 - Institutional restructuring
 - Regulation and enforcement of reef resource exploitation
 - Management of tourism and recreational activities
 - Management of land-based activities and coastal development
- Establishment and effective management of marine and coastal protected areas (MACPA's)

Values of Coral Reef MACPA's

- Critical role in the management for long-term conservation and sustainable use of coral reef biodiversity
- Focal points for development of governance for marine and coastal ecosystems
- Provide for education and training in the importance of conserving marine and coastal biodiversity
- Sites for long-term research and monitoring

Integrated Coastal Zone Management

- Successful tourism will depend on clean, non-polluted water and healthy coral reef ecosystems. ICZM is essential to manage increasing human uses and accomplish these goals;
- Upholding existing agreements is vital;
- More marine protected areas should be established and existing reserves managed effectively; and
- Environmental impact assessments should be conducted in conjunction with coastal development projects



Capacity Building

- Enhance capacity to design and implement informed, effective integrated management systems.
- Enhance coral reef conservation education and outreach programs for both local populations and tourists.
- Effective hazardous material response programs should be developed and spill response capacities increased.

Improved Scientific Understanding of Coral Reef Ecosystems

- Enhance mapping and assessment of coral reefs with geo-spatial database management
- Support management-oriented research focused on:
 - Understanding the relationship of natural to anthropogenic impacts;
 - Conducting damage assessments and restoration efforts;
 - Understanding coral recruitment;
 - Understanding water circulation patterns that influence the distribution of reefs and the fate of pollutants
 - Developing an improved scientific understanding of what constitutes a “healthy” reef ecosystem and normal fluctuations in that ecosystem
- Establishment of Global Coral Reef Monitoring Network
 - Utilizing both volunteers and professionals
- Fisheries management data is limited and should be gathered to ensure populations of valuable species are conserved

Appendix V - Country and Organization Reports Not Included in this document

